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ABSTRACT

The Virtual University is an Internet-based learning environment developed at the University of Hagen (Germany). Complex teaching activities based on new concepts integrating net-based communication and cooperation facilities take place in the Virtual University. Experiences show that there is a threshold, especially for tutors in non-computer science fields, in using the new technologies for tutoring activities. The problem is that they have to arrange completely new organizational processes and manage the new technology. In order to ease the tutor's work, a net-based tutoring concept incorporating both organizational and technical support for tutors is being developed. This paper demonstrates the concept of a net-based tutoring wizard as a model for the management of virtual seminars. Topics discussed include: (1) concepts and problems of traditional and net-based tutoring; (2) characteristic functionalities of a tutoring wizard, including templates for World Wide Web-based tutoring, automatic generation of Web pages on the basis of the tutor's information filled in dialog boxes, support for publishing and changing information on the Web server, task management, notification mechanism, support of tutor groups, and integration of workflow aspects; and (3) implementation of a tutoring wizard prototype using Microsoft FrontPage. Four figures present sample screens. (Author/DLS)

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A Tutoring Wizard Guiding Tutorial Work in the Virtual University

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Abstract: The Virtual University is a netbased learning environment developed at the University of Hagen. Complex teaching activities based on totally new concepts integrating netbased communication and cooperation facilities take place in the Virtual University. Our experiences show that there is a threshould especially for tutors of non computer science fields to use the new technologies for tutoring activities. The problem is: they have to arrange completeley new organizational processes and they have to manage the new technology. In order to ease the tutor's work we are developing a netbased tutoring concept that supports tutors considering both aspects: organzational and technical support. We demonstrate our concept of a netbased tutoring wizard as a model for the management of virtual seminars.

1. Introduction

As life-long learning is getting more and more essential in professional life, distance teaching is getting more attention and has started to play an increasingly important role in all modern societies. It's core features are that it offers timely and locally independent studies, and that it supports on-demand learning as required today. Obviously, time to be spent at the university campus has to be kept at a minimum. A project team at the University of Hagen has developed a concept for a virtual university, implemented a prototype and tested it with students:

The Virtual University [Buhrmann et al. 1996] of the FernUniversität Hagen is a virtual university system that integrates all functions of a university into a complete, homogeneous, extensible and cost-effective system with an easy to use and intuitive user-interface. The main menu of the Virtual University [Fig. 1] offers the functions: *education* - for participation in courses, seminars, practical trainings and exercises, *news* - a campus wide blackboard containing all sorts of up-to-date information relevant to the users of the Virtual University, *office* - the component including administrative functions, *research* - offering access to all research-related activities in the university, *cafeteria* - a forum for social contacts between students, *library* - offering access to both traditional and digital libraries, *information* - a menu containing general information about the university, and *shop* - offering all material that can be purchased from the university.

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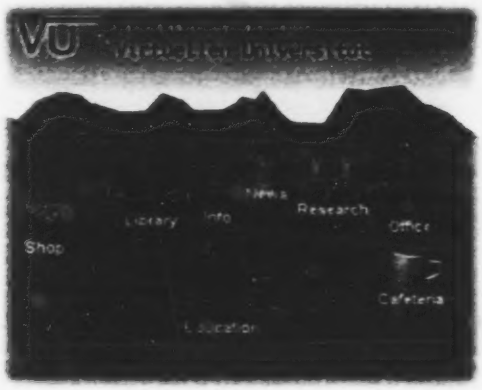

Figure 1: Home page of the Virtual University, http://vu.fernuni-hagen.de

The Virtual University supports totally new forms of learning like distributed working groups, seminars and practical trainings etc. Unfortunately, too many approaches focus on electronic delivery of learning material

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("online-university") - indeed, this is only a very small part of the overall concept of the Virtual University in Hagen. The major breakthrough comes from the integration of various media and communication and cooperation support via networks. In this environment the users learn an important element of today's industrial world: to cooperate in distributed processes and to manage and organize this kind of cooperation.

Of course, the impact of the Virtual University is not only restricted to students, but to all university users and user groups respectively tutors, authors, secretaries etc. Each user must learn to work and manage his job within the Virtual University system. Therefore user-interfaces fitting the individual user-groups' requirements must be developed.

Due to the fact that totally new forms of learning are executable in the Virtual University, particularly the tutors' work - organizing and managing teaching activities - changes. At the same time the integration of tutors is an important fact for the acceptance of our system: the more (teaching) activities we offer in the Virtual University, the more students will accept the system. As a reason, one important aspect of our future work is the development of tutoring interfaces.

In the following chapters we compare the tutors' work in traditional distance teaching environments with his tasks in netbased environments. The virtual seminar serves as an example for the comparison of tutoring tasks. Then we present our ideas for netbased tutoring support, again the seminar serves as an example. Of course, the tutoring concept is universal, extendable to other learning forms like practicals, exercises, courses etc.

2. Traditional and Netbased Tutoring - Concepts and Problems

All tutoring activities in a traditional distance teaching university must be well thought out, they have to be initiated a long time in advance; spontaneous reaction is nearly impossible. Most information is printed and sent to the students via mail. Personal communication is restricted to the phases of presence at the university; furthermore, communication between students and tutors is realized by mail or telephone, communication between students takes place rarely.

To give a practical impression of the tutors' activities in traditional learning environments, let us briefly describe the organization of a typical conventional seminar at the University of Hagen [Berkel et al. 1997]:
At first the tutors announce the seminar in the 'info', a booklet published every four weeks and sent to all 55.000 students of the University of Hagen. The students enroll by sending a postcard to the tutors. The tutors decide which student is allowed to participate and send a confirmation or cancellation to the students. Each confirmed student gets a specific topic he has to elaborate as his seminar contribution via mail. A written list of literature is added to help the student with searching for relevant literature. After two months, the student sends the written structure of his contribution to the tutors. They review the structure and send their comments and hints back to him. The student eleborates a written version of his contribution and a set of slides. During the elaboration phase, the student may contact the tutors via mail or telephone. Two weeks before final presentation, the students send the final version of their written contributions to the tutors. The presentation of all contributions takes place within two days at the university in Hagen. After the students' presentation, the actual topic is discussed between all students and the tutors. The students get the corrected and commented written version of their contribution back from the tutors. A booklet containing the corrected contributions is published for all participants of the seminar.

To summarize the problems of traditional tutoring:
- tutors publish mostly written announcements and information to very early dates (detailed seminar information must be fixed seven months in advance),
- tutors have rare contact to students (mostly in written form, but it is very tedious and normally restricted to only two discussion partners),
- there is nearly no possibility to react on students' remarks during the current semester (e.g. correct a mistake in the course material),
- tutors have to clearly define the problems for the students (e.g no participation of the students in the selection of topics),
- hardly cooperation / arrangement between students to deal with overlaps concerning their topics.

Netbased tutoring can reduce most of the above mentioned problems in distance tutoring, but some other difficulties - especially for the tutors - arise. We examined them on the basis of the virtual seminar, an example for distance tutoring via networks [Berkel et al. 1997]. The seminar was carried out in the winter of 1996/97 with students from the faculty computer science. All (traditional) seminar activities described above were carried out over the internet. Therefore, various internet services - asynchronous components like email, news, ftp and www and synchronous components like chat, audio- and videoconferencing - were mixed in different combinations for specific seminar activities. The used internet services were integrated into the Virtual University user interface, based on the www. Students could initiate all activities by mouseclick (search for adequate communication partners, participate in a seminar videoconference or read the seminar newsgroup) from the seminar web pages.

We noticed that most negative aspects of traditional distance tutoring could be reduced in the netbased learning environment as described for the virtual seminar: spontaneous reaction on students' remarks was possible, various communication offers between students and tutors and students themselves were available, tutors could leave problems to the students to decide or they could help amongst themselves via network based communication. The tutors merely played the role of moderators who coordinated various messages, comments, remarks and hints of the students and organized and published them to the other participants. Therefore, in contrast to traditional seminars the tutors needed to have advanced technological knowledge about the internet and the usage of internet tools in order to generate the seminar web pages and to support the students with technical hints and tips, establish communication offers and integrate them in an easy-to-use way for the students.
To summarize the results: there are two elementary new tasks for tutors (apart from the effort for achieving a rudimentary knowledge and experience in the use of internet tools):

- the organization, technical arrangement and presentation of information produced during the far more dynamic process of netbased teaching activities and
- the moderation and management of students' collaboration.

Both aspects must be regarded in further developments of the Virtual University. In this paper, we focus on the first aspect. Therefore, we develop a concept of netbased tutoring - a tutoring wizard - supporting tutors in arranging the technical frame for their work. Our approach will be presented in detail in the following chapter.

3. Concept of a Netbased Tutoring Wizard

Netbased tutoring as described in the previous paragraph includes various - sometimes quite technical - activities. In contrast to traditional tutoring activities, most of the netbased tasks can be supported electronically. Our idea is to develop a tutoring wizard, that simplifies the process of creating and managing webbased tutoring activities:
The tutoring wizard is an application that offers an easy-to-use interface to the tutor. It supports standardized organizational frames for the tutor's work and helps him to collect, organize and presentate the neccessary information without having much knowledge of the underlying technologies. The wizard automatically creates and manages webbased information and reminds the tutor of forthcoming dates and tasks and delivers information automatically to responsible persons.

A scenario clarifies our idea: The tutors Berkel and Lenzen shall organize a seminar. The first task they have to deal with is the seminar announcement. They start the tutoring wizard, authentify themselves and select 'seminar' as the tutoring activitiy to support. Now they have to fill in the course number, the title of the seminar and the names of the responsible tutors. Furthermore they specify the kind of communication offers they would like to integrate into their presentation. The wizard now initiates all server based activities like creating a seminar directory on the web server, installation of communicational offers (e.g. sending a mail to the web administrator) etc. Now the announcement text must be filled in. Therefore, the tutors fill in all relevant information in the textfields of the step-by-step presented dialog boxes. With the inserted text the wizard generates on the basis of a seminar template a web based seminar presentation including all necessary web pages (e.g content and navigation pages). The tutors chose the 'Publish'-command in order to publish the information on the web server. For the moment, they leave the program. If any reaction of the tutors is required (e.g. the tutors specified a discussion which is announced for the next days) the wizard mails a message to the tutors reminding them of publishing further infos.

The scenario shows some characteristic functionalities that are expected of a tutoring wizard:

Templates for webbased tutoring: The wizard includes various templates for the diverse tutoring activities. The templates generate frames for complex web pages based on elementary components: e.g. header and footer pages, navigation functionality, frame construction etc. Changing the elementary component header page means that the header page changes in all web pages of the current tutoring web.

Automatic generation of web pages on the basis of the tutors' information filled in dialog boxes: The users need not to know anything about the techniques to process material in suitable formats: the wizard automatically generates the information the tutor fills in the textfields of the wizards' dialog boxes into suitable formats, e.g. directly as HTML web pages or as database input which is generated later to appropriate formats. The advantage is: The user needs not to know HTML or any other web presentation language. Furthermore, information can be integrated in various web pages - e.g. the title of the seminar is the header of each seminar web page - the tutor must fill it in only once, the wizard automatically copies it to various locations.

Support of publishing and changing information on the web server: A publishing assistent helps the tutor to publish the seminar presentation on the Virtual University web server. The assistant can be activated by clicking a simple 'Publish to Web'-button. It includes the address and the parameters for publishing, the tutors do not need to start a completely new (ftp) program.

Task management: The wizard gathers all further to do's in a task list, that shows what kind of action is requested and at which time it is requested. The tasks might be weightened (showing the priority of the task) either by the system on the basis of definitely required information or by the tutor's subjective estimation.

Notification mechanism: Time fixed tasks can be related to a notification mechanism that reminds the responsible tutor of the task. Notification might be implemented via mailing mechanisms.

Support of tutor groups: Suggesting tutors often work in small groups, the wizard should support group oriented tutoring. Therefore specific functionalities like the management of tasks depending on the tutor's identity, gradual access restrictions etc. must be considered.

Integration of workflow aspects: For tasks depending on subtasks, a task workflow can be described. It automatically generates the following to do's and reminds the responsible tutors of the next steps to do.

Some further requirements derive from the Virtual University platform. They comprise aspects like: an easy-to-use interface, multi-platform compatibility, compatibility to existing software and the ability to expand the system with further software packages, services and protocols.

4. Implementation of a Tutoring Wizard Prototype

A first rudimentary prototype is implemented on the basis of Microsoft FrontPage. FrontPage is a web publishing and administration tool, that supports templates and wizards. It does not fullfil the requirement of multi-platform compatibility, but to begin with the work we can suggest that tutoring activities are done on PC's. Furthermore, the tutors can work on their web presentations individually by using the FrontPage tool. In any cases, the FrontPage interface [Microsoft 1997] enables us to rapidly develop a specialised tutoring wizard showing our ideas described above.

The templates implemented in FrontPage build up the basic structure of web based seminar presentations: a frame structure subdeviding the screen into navigation and content pages, and a number of pages containing the diverse seminar information (announcement / introduction, content / themes, organization, lectures, communication / discussion). Furthermore, additional pages like glossaries, guest books, literature tips and blank pages can be included. A description and a preview of the templates is shown to the tutor in the preview window [Fig. 2].

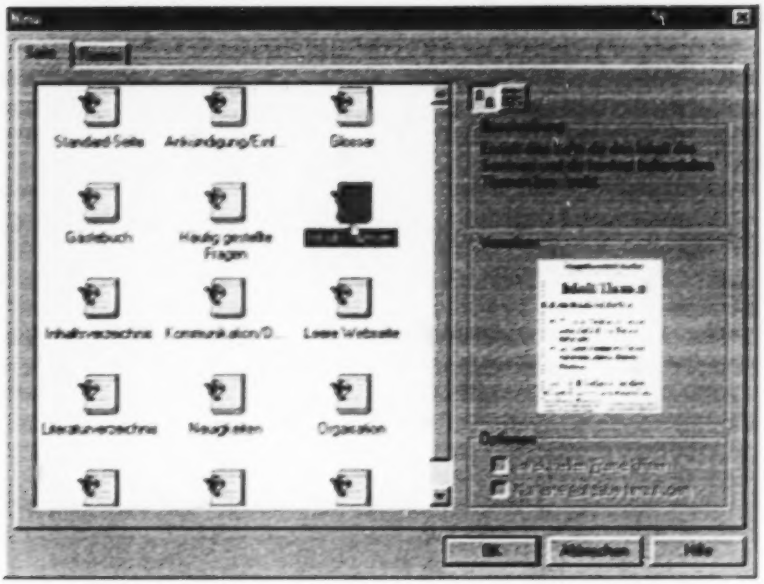

Figure 2: Seminar specific templates integrated in FrontPage

Dialog boxes are implemented to support the user in collecting the tutoring information. On the basis of earlier chosen templates the given information is integrated into the seminar presentation. This functionality is realized by self-implemented FrontPage wizards, independent executable programs written in Microsoft Visual Basic that collect input from the user in a series of dialog boxes, then place OLE automation calls to drive FrontPage by 'remote control' to create new web pages.

The seminar wizard asks the tutor step-by-step about the structure and the design of the seminar information and about the information itself; e.g. in the fiest step the tutor has to decide on the frame structure (navigation menu left side or at the bottom), afterwards he selects the required pages for his presentation [Fig. 3], then he fills in the seminar title and a short description and so on.

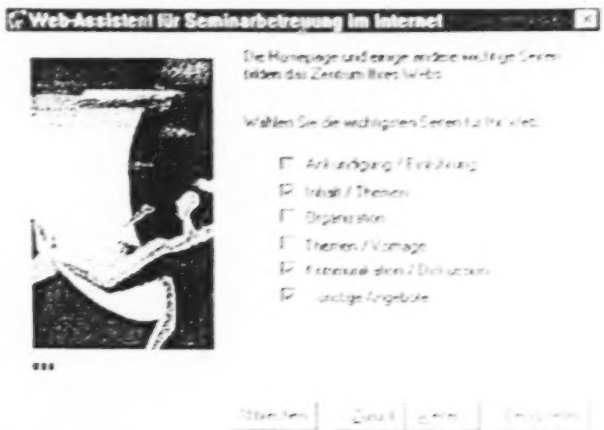

Figure 3: The wizard supports the user with dialog boxes

After filling in the information a 'seminar presentation' (in FrontPage called FrontPage Web) is created by remote control. The user can see the result and work on it with the FrontPage program [Fig. 4]. At the same time, a task list will be generated. The FrontPage web publishing functionality supports the publication of the created web on the basis of the WebPost API, an API for publishing information to web servers.

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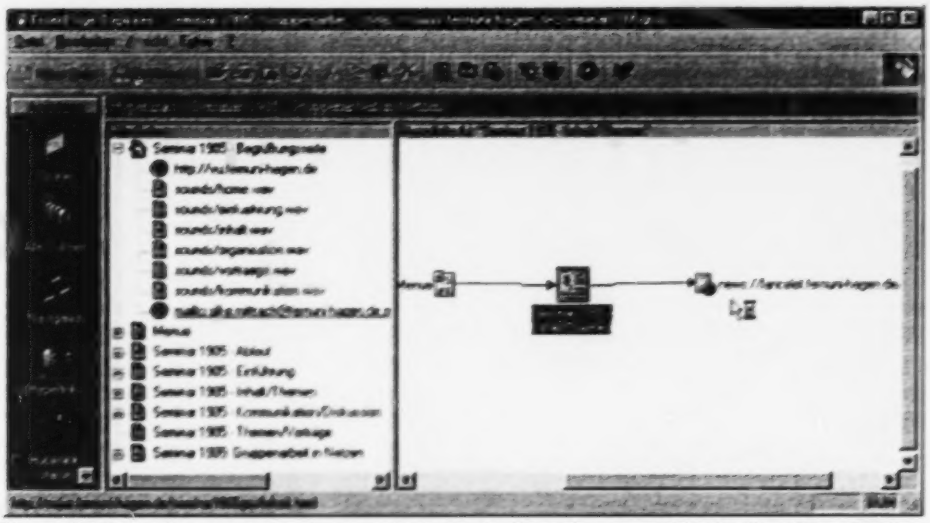

Figure 4: The web presentation is created automatically and presented in the FrontPage Explorer

5. Summary and Prospects

In this paper we present the tutors role in a distance teaching environment. Tutors in virtual environments have to manage technical processes, therefore they need a basic technical knowledge. The tutors' work is changing with regard to organizational (completely new courses) and tutorial aspects (tutor as a moderator). The paper shows our concept of a tutoring environment supporting tutors with regards to organizational aspects of their work.

A first prototype is implemented on the basis of FrontPage, a web administration and creation tool that supports some of the basically required functions. Primarily, further implementations shall demonstrate our ideas, e.g. the FrontPage task list will be extended with mailing functionalities, and experiences with users must show the suitablility of our approach. Aspects like group support and workflow integration must be concepted in detail.
Later on, aspects like the dynamic generation of information will lead us to (re)implement the system in combination with the VU databases: information will not be any longer managed in static HTML pages, but generated dynamically just-in-time and on-demand. Therefore, the seminar information will be saved in VU databases.

6. References

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